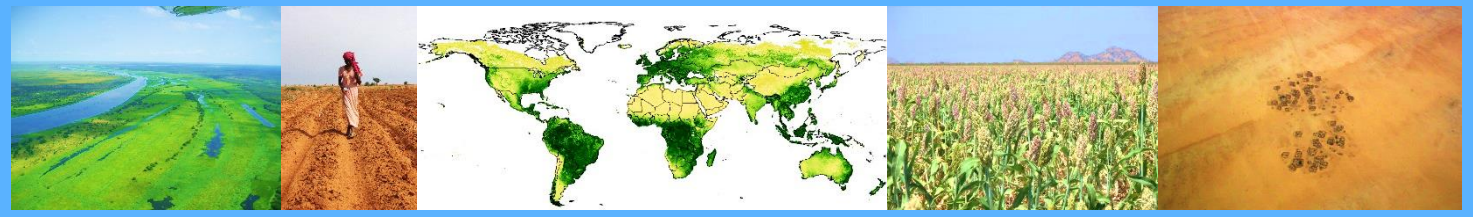

El Niño: Implications and Scenarios for 2015

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El Nino: Regional Highlights for 2015

An El Nino event active since February 2015 will almost certainly last through 2015 and may extend into early 2016. The intensity of this event is beginning to increase with a peak expected in the last quarter of 2015. Potentially this could become one of the strongest El Nino of the last 20 years. However, favourable patterns of sea surface temperatures in the Indian Ocean could mitigate some of the negative impacts.

Region	Countries Red=Negative; Green=Positive	Timing	Summary
Central America	Most, plus Haiti	Primera, March-August Postrera, Aug-November	• Unfavourable development of the current cropping season, particularly in Haiti. • Lingering effects of the severe drought that affected the first season of 2014. • Pessimistic forecasts for the rest of 2015. If realized, the region could face poor performance in both growing seasons.
West Africa	Senegal-Mauritania Niger, Chad	June-October	• Poor start to the 2015 growing season across Sahel. • Senegal and southern Mauritania endured a severe drought in 2014. • Drier than average conditions and shorter growing periods are forecast for Senegal-Mali and Niger-Chad regions.
Sudan-Ethiopia	Sudan, South Sudan, North and central Ethiopia, Eritrea, Djibouti	Belg: March-May Meher: June-October South Sudan: May-Nov Sudan: June-November	• Central and north-east Ethiopia experienced a very poor first season (Belg) in 2015. Also affected were neighbouring areas of Somalia, Djibouti, and southern Eritrea. The second and main season (Meher) has so far had a normal start in Ethiopia. • Eastern South Sudan and Sudan are experiencing a very good start to the agricultural season. • Forecasts for the core July-September period are pessimistic for all countries, possibly with the exception of conflict stricken South Sudan. Ethiopia will experience two poor growing seasons in the same year if indeed these forecasts are realized.
Indian subcontinent and South Asia	India, Pakistan, Philippines, Indonesia	Jun-Oct, and secondary seasons that follow Indonesia: October-April main season	• The start of the monsoon season in India is favourable. This is in contrast to the drier than average conditions observed in southeast Asia where the main and secondary growing seasons could be affected, particularly in Philippines and Indonesia. • Forecasts for core July-September rainfall indicate a drier than average monsoon season in India and dry conditions in Indonesia. Moderately favourable conditions are expected in southeast Asia and Philippines. • Forecasts for the last quarter of 2015 are pessimistic for growing seasons in most of the region, particularly Indonesia.
Horn of Africa	Kenya, Somalia, Uganda, SE Ethiopia	October-December	• Historically there are very strong links between El Nino events and wetter than average conditions in this region. • Good “Long Rains” in early 2015 brought much needed relief to the pastoralist communities affected by previous droughts • Forecasts for the coming “Short Rains” are favourable for the entire region, facilitating a continued recovery in pastoralist areas.
Southern Africa	South Africa (main producer), Zimbabwe (large deficits), Malawi (recent impacts), others	October-April	• The last growing season was impacted by the early stages of the current El Nino resulting in sharp production losses across the region. • The current forecasts are pessimistic for the early stages of the coming season (Oct-Dec). This raises the possibility of two consecutive poor cropping season against a backdrop of much reduced regional stocks.

An El Niño season: The Evidence

Skip To Regional Impacts

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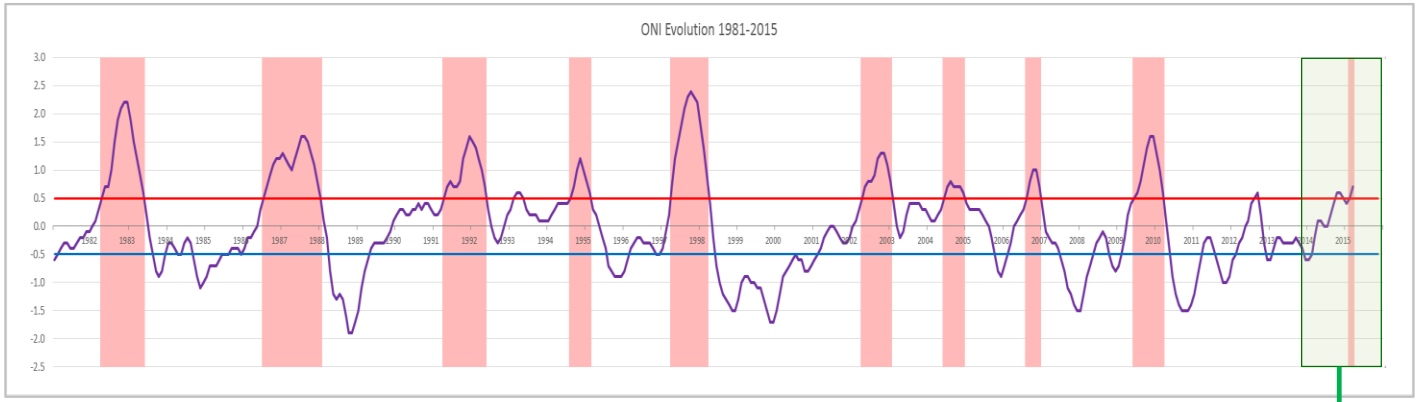
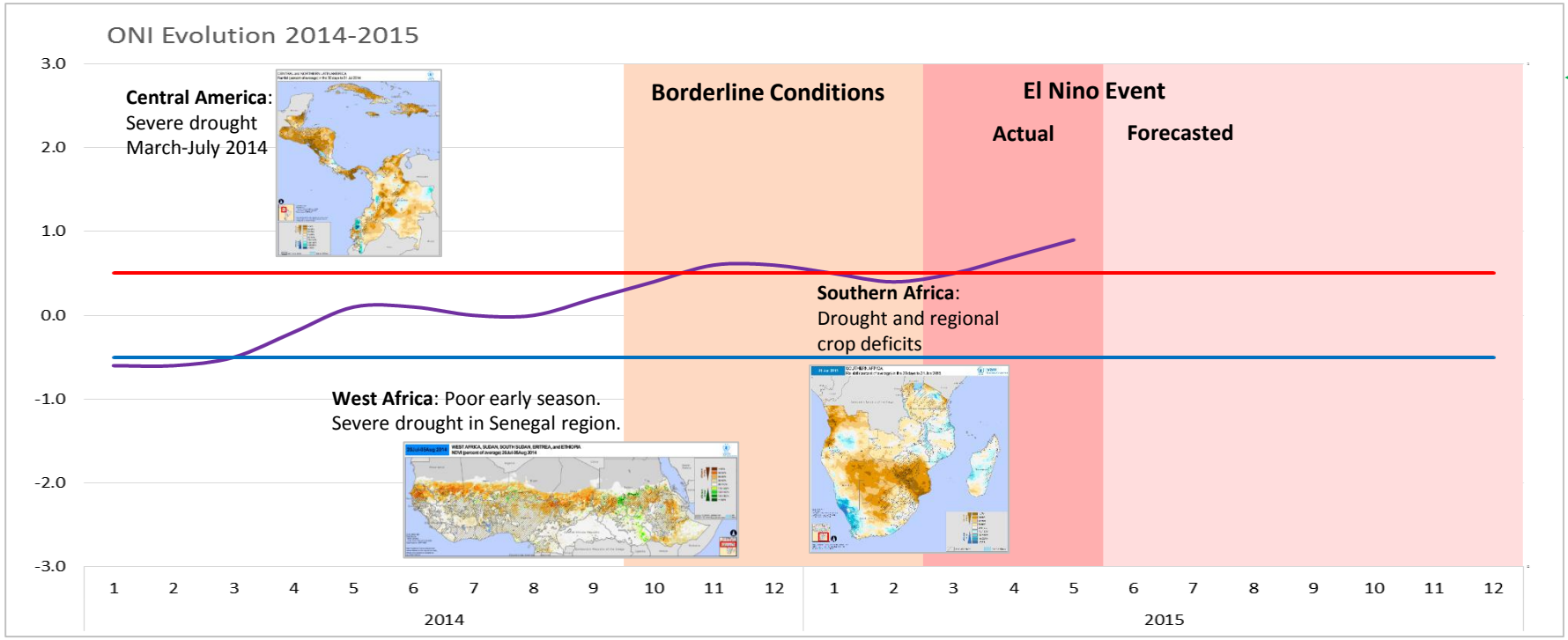
2014: In the Run-up to El Niño

Key 2014 events and El Nino

Throughout 2014, inter-tropical Pacific sea surface temperatures rose steadily from the below average values observed in 2013. They remained near borderline values for sometime (October to February) before finally breaking the El Nino threshold (+0.5C) in March 2015.

Although a full blown El Nino event did not develop until early 2015, the performance of the 2014 growing season in many places around the globe (Central America, parts of West Africa and Asia and Southern Africa in particular) was similar to that of under a typical El Nino.





The current El Nino event within the 1981-2015 period (above) and its evolution during 2014-2015 (left).

Also shown are major seasonal events prior to and after the onset of the current El Nino in March 2015

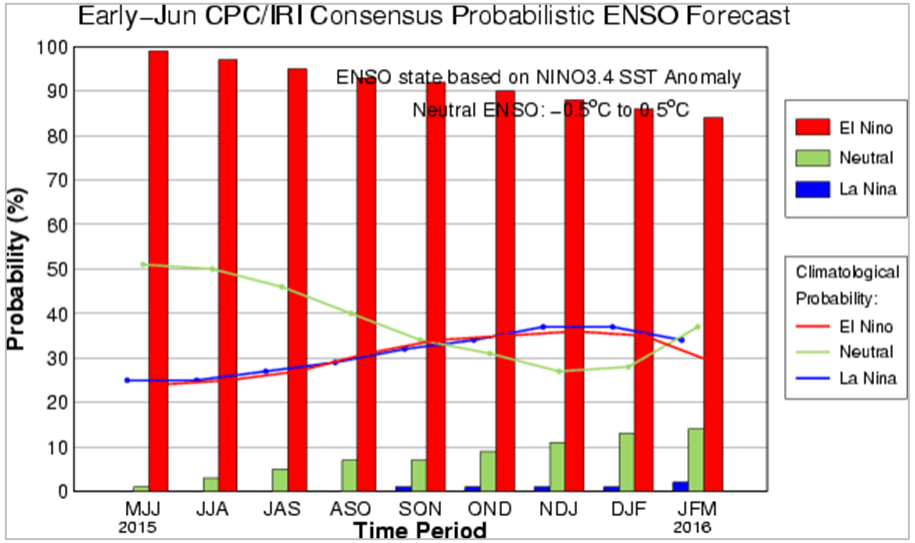
2015-2016: An El Nino Year

El Nino Current Situation

There is an on-going El Nino event since March 2015 which is expected to strengthen.

How long is the El Nino going to last?

The overwhelming evidence is that the current El Nino event is almost certain to remain active throughout 2015 and likely to extend into early 2016.



Plot shows the probability of an El Nino event taking place (red bars) versus those of conditions turning neutral or towards an El Nina event (green and blue bars respectively).

El Nino probabilities remain very high (above 80%) through 2015 and early 2016. Results from other centres are very consistent with this result.

Source: International Research Institute and NOAA's Climate Prediction Center.

Summary of the Evidence: Occurrence and Magnitude

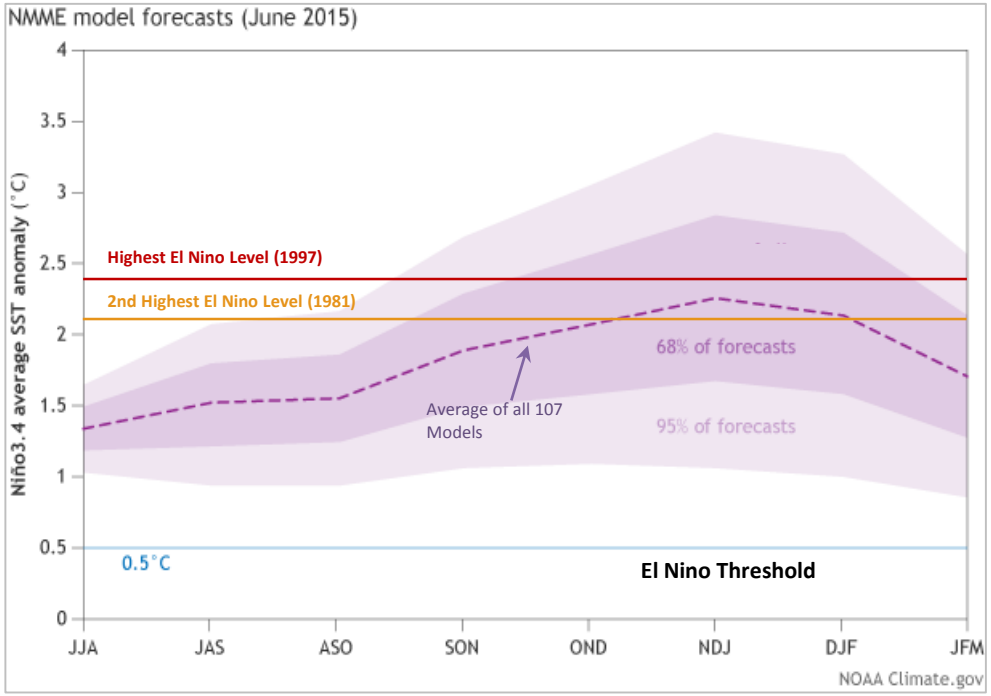
Is it likely to be a strong event?

...we can expect at least a moderate event. However, there is a significant chance that this event could reach some of the strongest levels of the last 35 years.

Where is the evidence?

Forecasting centres run many models in groups ("ensembles"), each model with a slightly different behaviour related to the uncertainties about the state of the ocean and atmosphere. As the models forecast the El Nino evolution into the future, they diverge more and more. It is this divergence that allows us to evaluate how certain we can be about a certain outcome.

Although the intensity remains uncertain as observed by the spread of the forecast "plume" in the figure below, the line depicting the average of all 107 models almost reaches the record peak observed in 1997.



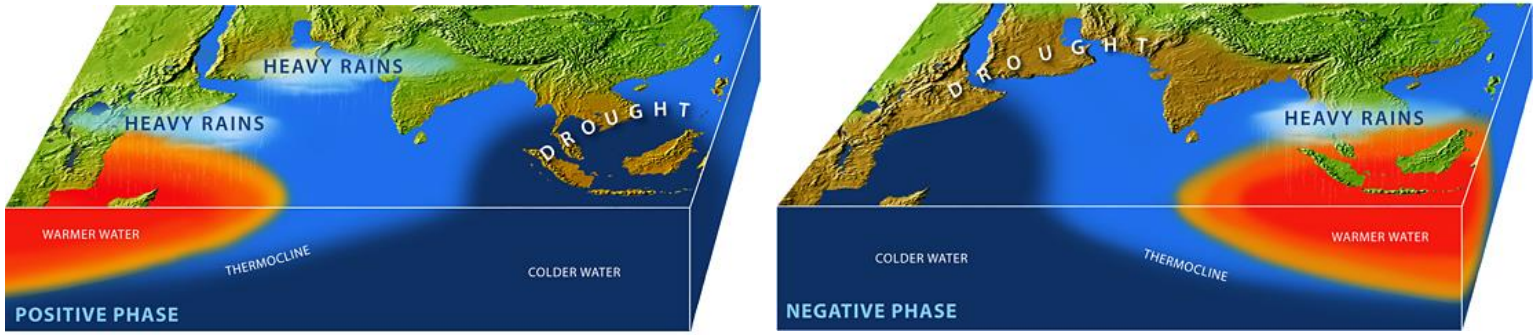
Multi-model ensemble forecast of El Nino indicator. Dashed line is average of all models, shaded bands indicate spread of the models

Source: NOAA (similar plots are produced by a variety of centres)

Other Drivers (It's not all about El Nino...)

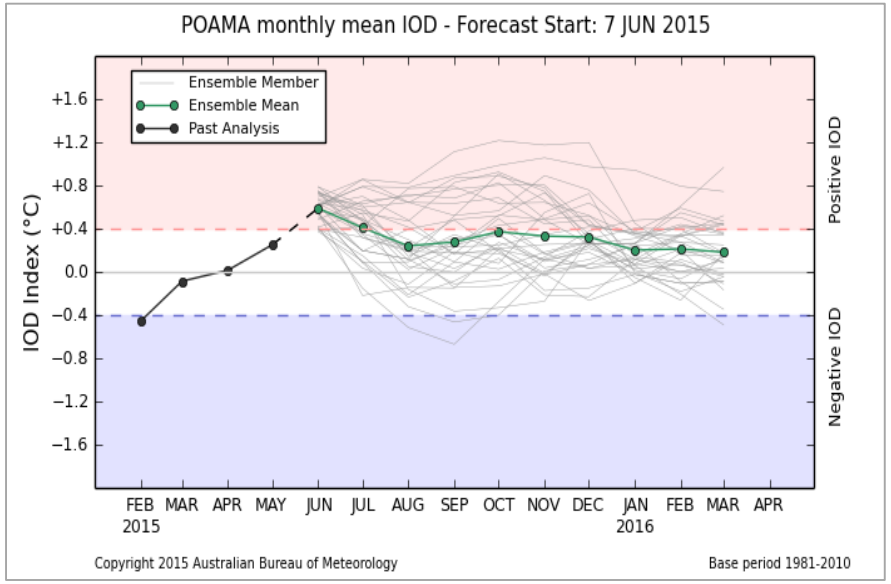
What else might play a role?

The El Nino is not the only determinant of the performance of the growing seasons. Other ocean temperature patterns also influence the outcome. More specifically, the pattern of sea surface temperature in the Indian Ocean known as **Indian Ocean Dipole** (IOD) plays an important role.



What is the Indian Ocean Dipole (IOD)

The IOD is a pattern of sea surface temperatures in the Indian Ocean that switches between a positive phase (left) defined by warmer than average waters in the western Indian Ocean and colder than average waters off Malaysia and Indonesia. A negative phase (right) has the inverse pattern.



Current IOD status

The IOD can interact with concurrent El Nino events. In a positive phase it is associated with a moderation of El Nino impact and the opposite in a negative phase, mainly in the eastern half of the African continent, South Asia, South East Asia and Indonesia.

Currently the IOD has just entered a positive phase. It is expected to continue to hover near the edge of this phase till early 2016. – see plot on the right. This may moderate some of the impact of El Nino during the northern hemisphere Summer.

Consequently, the expected effects of El Nino in East Africa (South Sudan, Sudan, Ethiopia) and in parts of Asia (Pakistan, India) could be lighter than expected. The opposite may occur in South East Asia and Indonesia.

Initial developments of the growing season seem aligned with these patterns.

WFP Regions: Current Conditions and Near Term Scenarios

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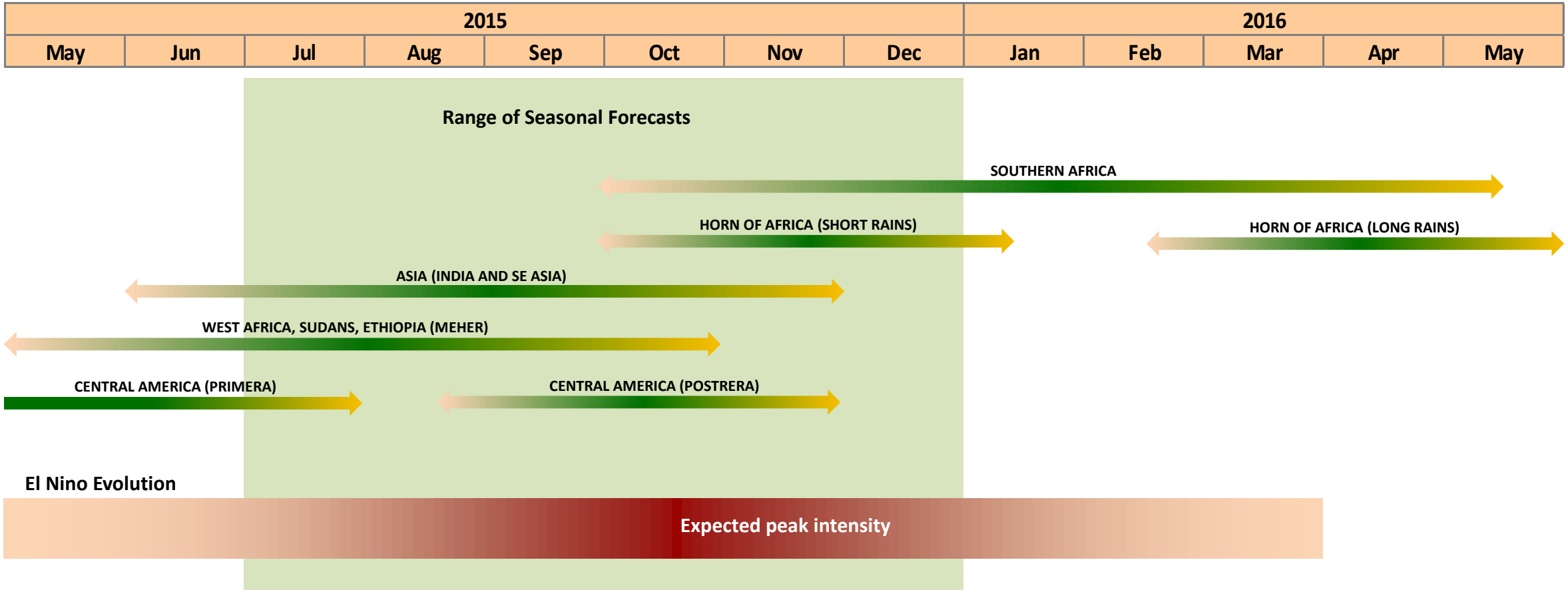
2015-2016: El Nino Calendar

Seasonal Timings and El Nino 2015-2016



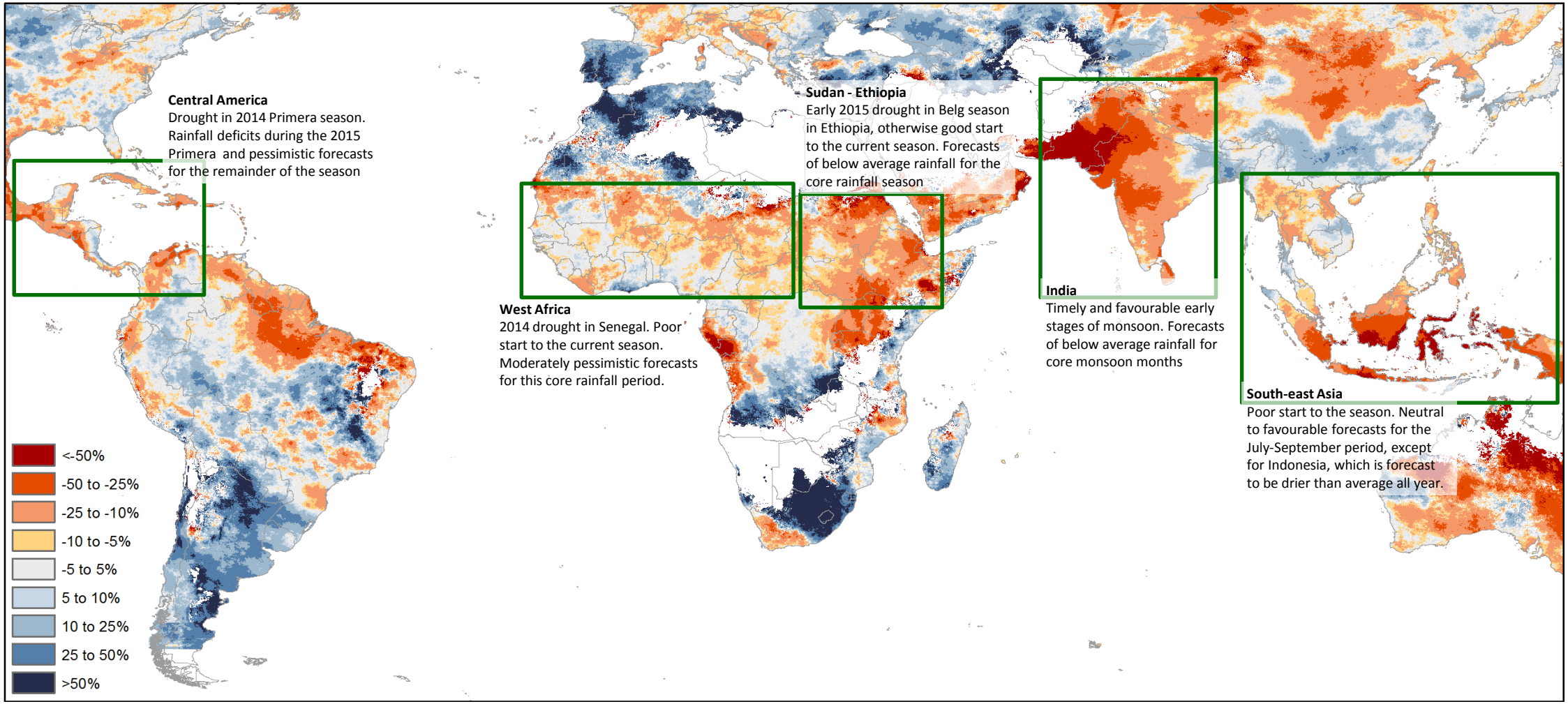
Timing of Growing Seasons and El Nino development

The figure above shows the timing of the growing seasons along with the temporal coverage of seasonal forecasts. The El Nino event as it develops will influence most growing seasons to some extent. The seasonal forecasts will be updated every month to develop more detailed scenarios of the seasons progression.

El Nino: Geography of Impacts

Summary Impact Map: July-September 2015

El Nino impacts on July-September rainfall: Relative Difference between El Nino and Neutral conditions (1982-2013)



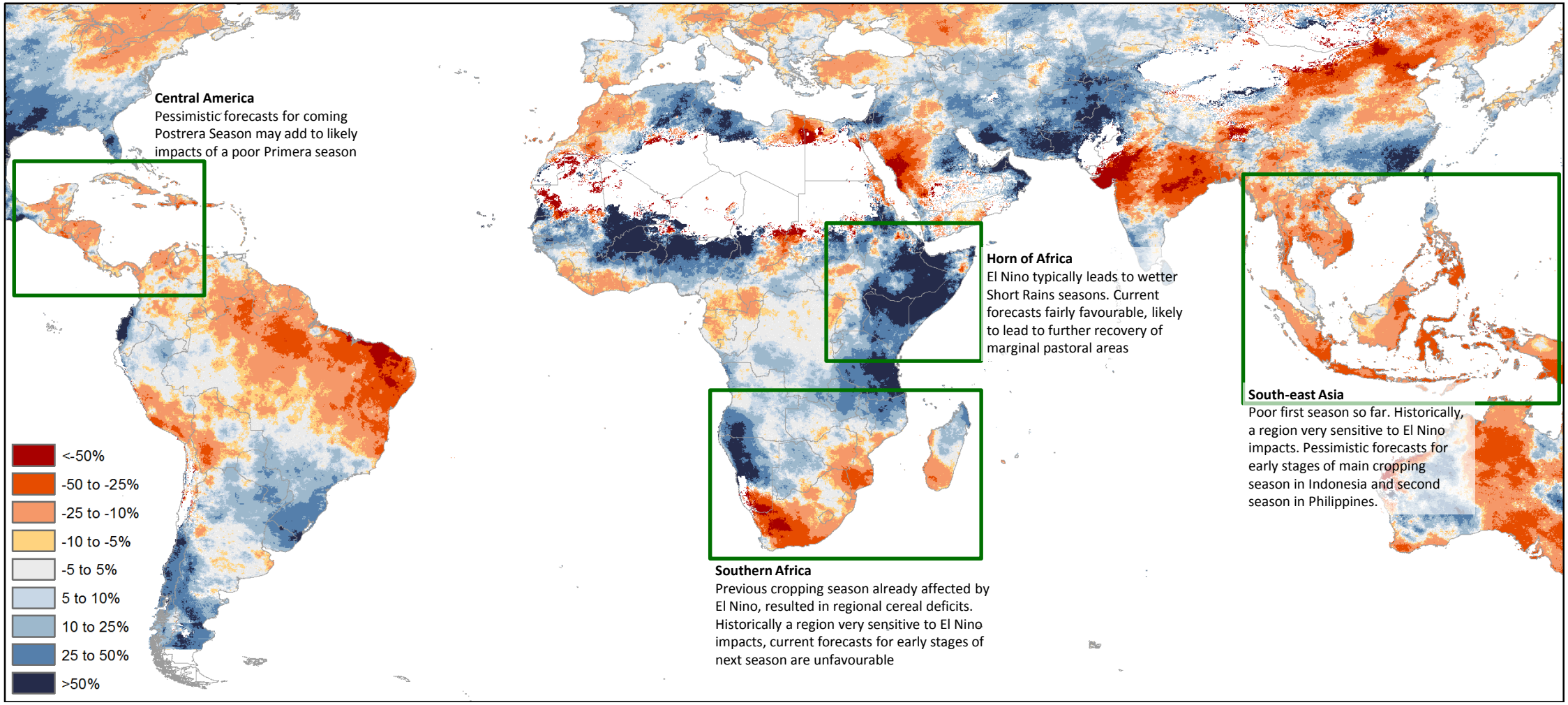
***Boxes**: Summary impacts (previous season, current situation and rainfall forecasts) for July-September (JAS) 2015, over WFP regions of interest where a growing season is taking place*

***Underlying map**: Magnitude and sign of El Nino impacts on JAS rainfall (1982-2013) expressed as a comparison between average JAS rainfall in El Nino years and average JAS rainfall in neutral years; orange shades for El Nino JAS drier than neutral, blue shades for El Nino JAS wetter than neutral.*

El Nino: Geography of Impacts

Summary Impact Map: October-December 2015

El Nino impacts on October-December rainfall: Relative Difference between El Nino and Neutral conditions (1982-2013)



***Boxes**: Summary impacts (previous season, current situation and rainfall forecasts) for October-December (OND) 2015, over WFP regions of interest where a growing season is taking place*

***Underlying map**: Magnitude and sign of El Nino impacts on OND rainfall (1982-2013) expressed as a comparison between average OND rainfall in El Nino years and average OND rainfall in neutral years; orange shades for El Nino OND drier than neutral, blue shades for El Nino OND wetter than neutral.*

Regional Seasonal Outlook

West Africa, July-September 2015

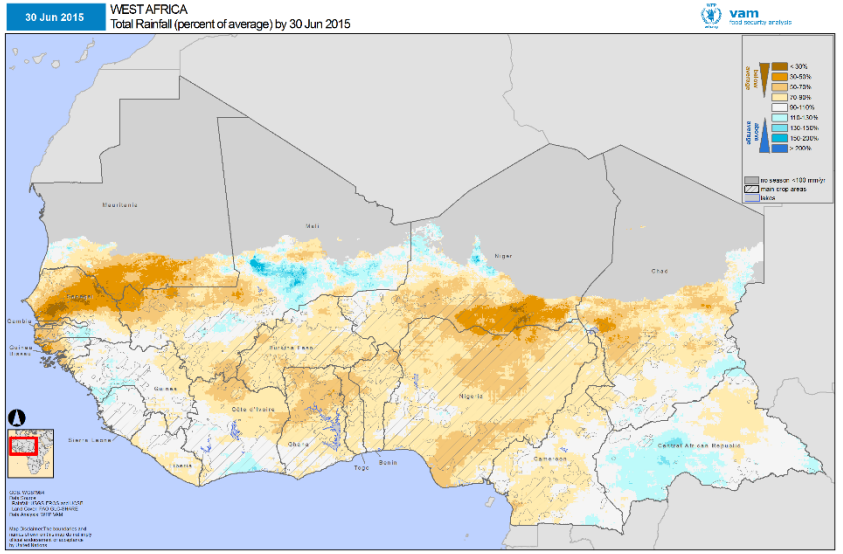
The Situation So Far (late June 2015)

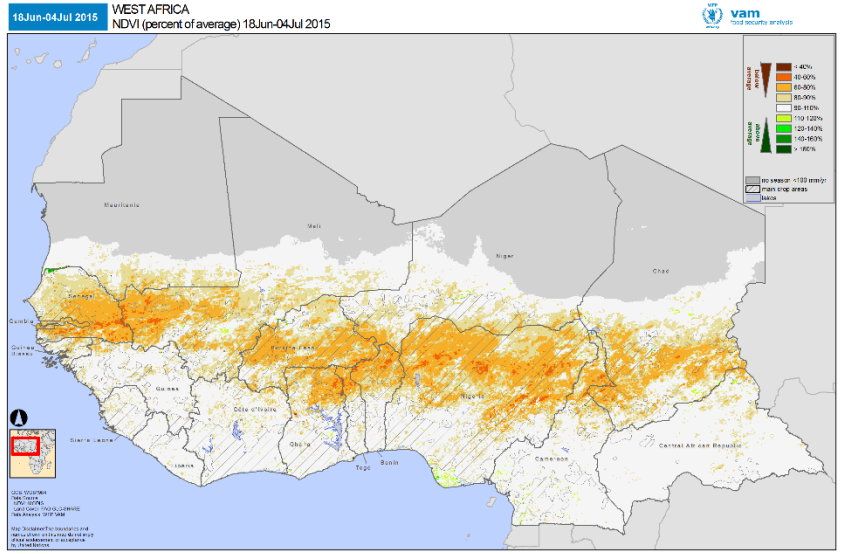
Late May, early June correspond to the very early stages of the season in the Sahel. In more southern areas (e.g. south Mali, Burkina, south Chad, Nigeria), planting would normally have started, but further North, it is the July rains that usually enable the start of cropping activities.

So far the dominant pattern is one of below average rainfall as the monsoon-like northward movement of the rains has been slower than usual.

Seasonal vegetation development already shows the effects of the early season rainfall deficits, which translates into delays in planting and early crop development.

Early signs are therefore pessimistic and historically El Nino events do tend to have a significant impact on the Sahel region. Note that the Senegal-Mauritania region already registered a severe drought in 2014.





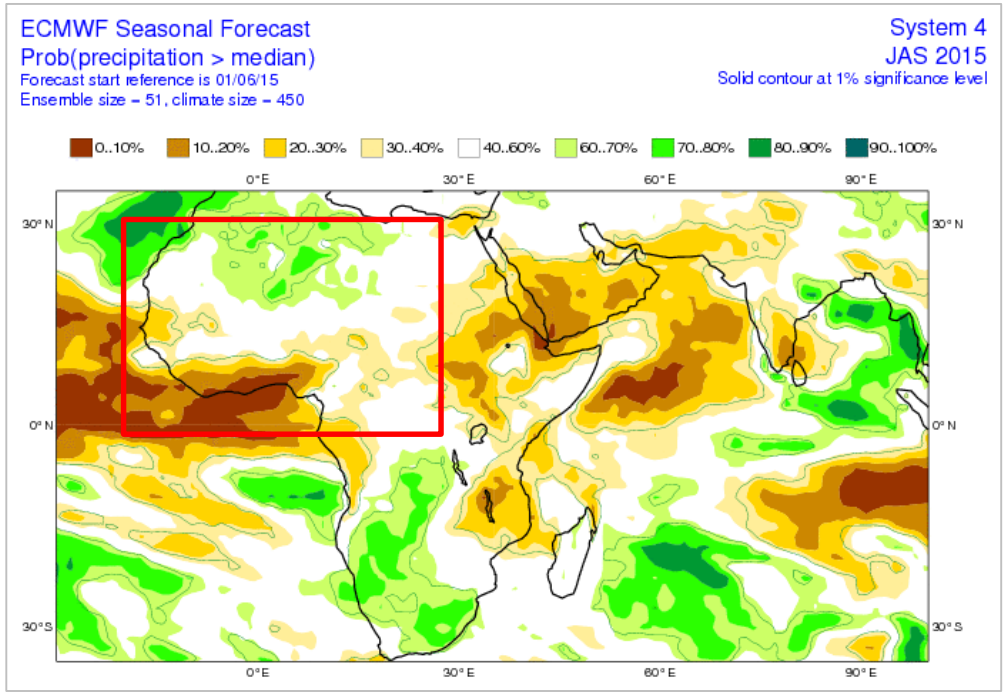
Rainfall (left) and vegetation (right) conditions by end of June 2015. Warm shades for below average conditions, cool shades for above average conditions.

Current forecasts for July-September

July-September is the crucial rainfall season in the Sahel. Most forecasts predict drier than average conditions in Senegal and Mauritania region. Similar conditions are also forecast for the Niger-Chad areas.

The Agrhymet Centre has recently released forecasts for later than usual starts and earlier than usual ends of the growing period across the Sahel.

Seasonal forecasts for July to Sept rainfall; orange to browns, drier than average, green shades wetter than average.



Regional Seasonal Outlook

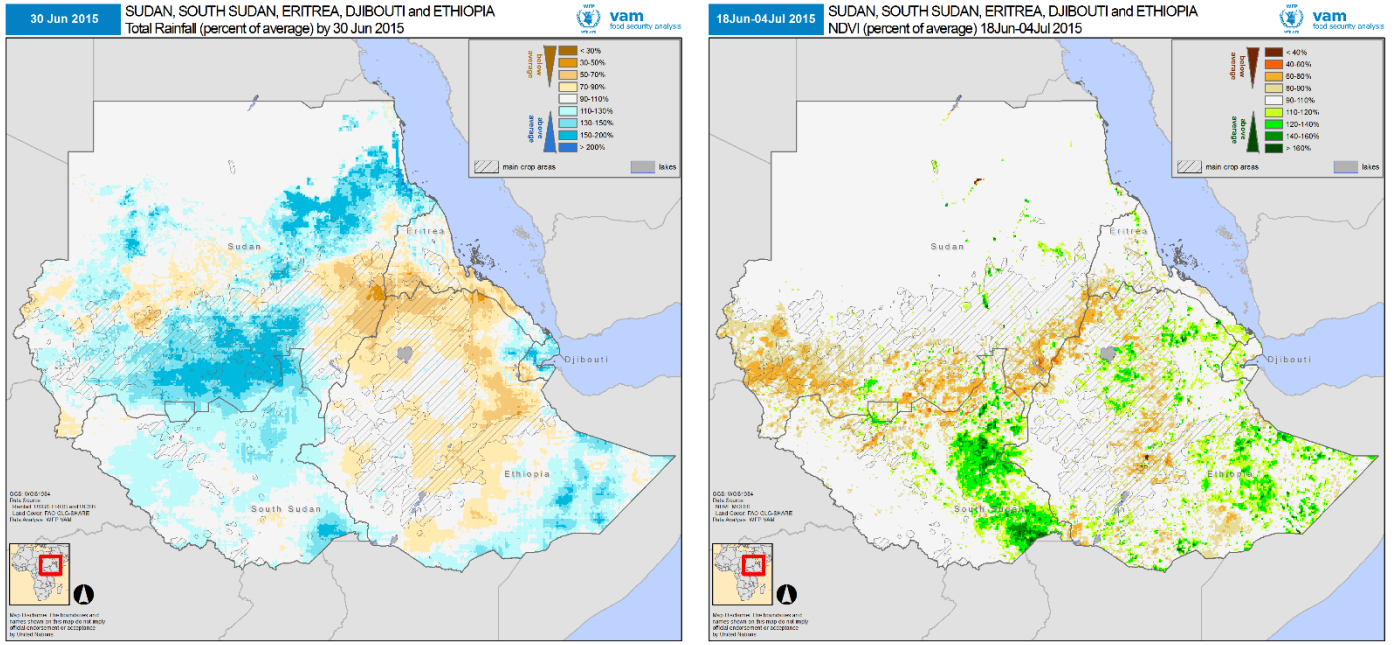
East Africa: Sudan-Ethiopia, July-September 2015

The Situation So Far (late June 2015)

Late May, early June correspond to the early stages of the growing season in South Sudan by which time most planting of the first crops has been completed. In Sudan and Ethiopia's northern areas, the season usually does not start until mid to late June.

The early stages of the season (up to early June) were quite favourable in South Sudan and southern areas of Sudan, with early and abundant rainfall leading to above average vegetation. However, mid and late June turned dry, reversing early gains.

In Ethiopia, bimodal areas experienced a very poor first season (Belg) due to severe rainfall deficits during March to May. The second season or the main season in unimodal areas (Meher) started well, but is also now affected by dryness. The actual performance of the season truly depends on the rains received in July through September. This period is starting on a drier than average note.

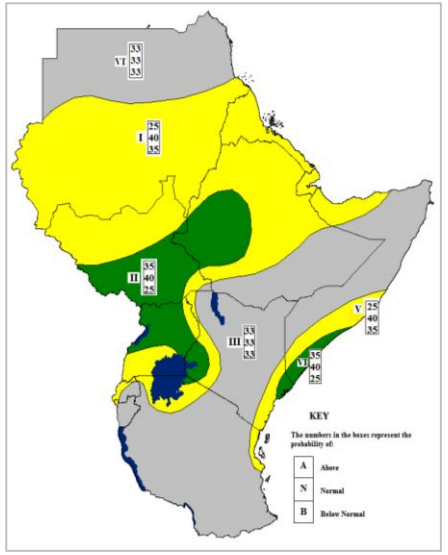


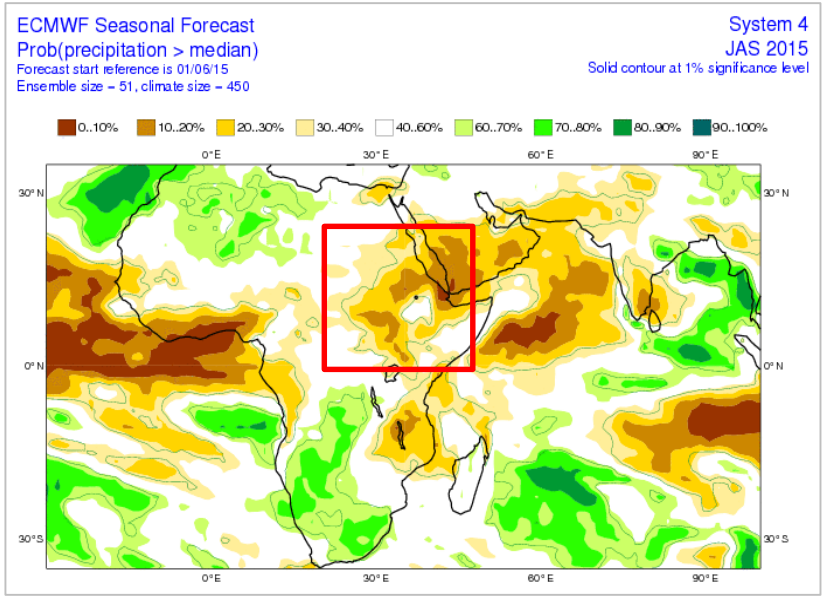
Rainfall (top left) and vegetation conditions (right) by end of June 2015. Warm shades for below average, cool shades for above average conditions.

Current Forecasts for July-September

ECMWF and UK MetOffice are predicting generally drier than average conditions for Sudan, Ethiopia, South Sudan and Uganda. However, the IGAD's Climate Outlook Forum published a more optimistic forecast for the southern half of South Sudan, Uganda and central-western Ethiopia. Otherwise it is in agreement for the rest of the region.

Ethiopia is a concern given the chances of a poor Meher (main) season after a bad Belg season earlier in 2015. South Sudan is also a worry where even a moderately drier than average season could create a major food security crisis given the current conflict.





Seasonal forecasts for July to Sept rainfall (right); yellow to browns, drier than average, green shades wetter than average.

Regional Seasonal Outlook

Central America, August-November 2015

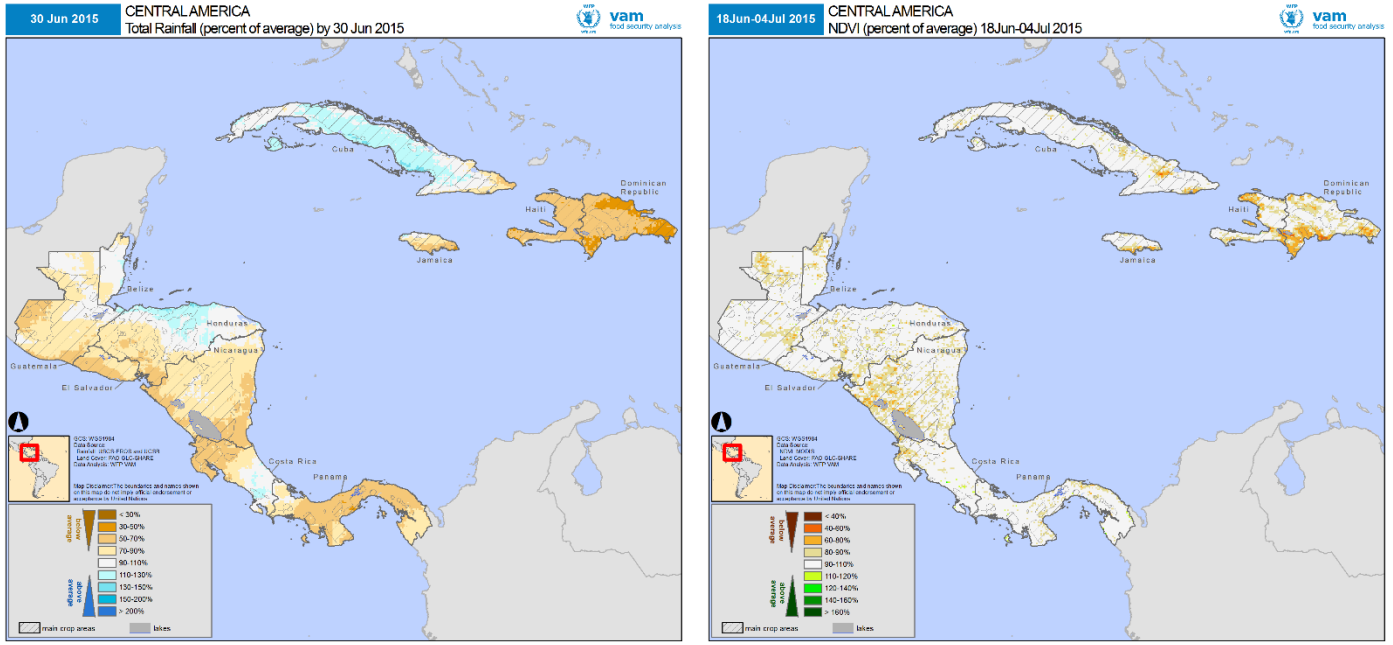
The Situation so far: *Primera* Season (Mar-Jul 2015)

The *Primera* season, extending from March to July, is the first of the two growing seasons in the Central America region. A second season (*Postrera*) follows from late August to November. Historically, the region shows strong links with El Nino events, often resulting in rainfall deficits and poor crop production.

The current 2015 *Primera* season had a fairly poor start with significant rainfall deficits across the region, particularly in the eastern (Pacific) board and in Hispaniola, resulting in below average development of the vegetation.

In June, rainfalls improved across parts of Central America, but seem to edge to drier conditions again, while continued rainfall throughout July is needed for the season to improve significantly.

In Haiti, however, the situation has not improved given the large rainfall deficits that remain due to continued drier than average conditions in June, raising concerns about poor crop production.

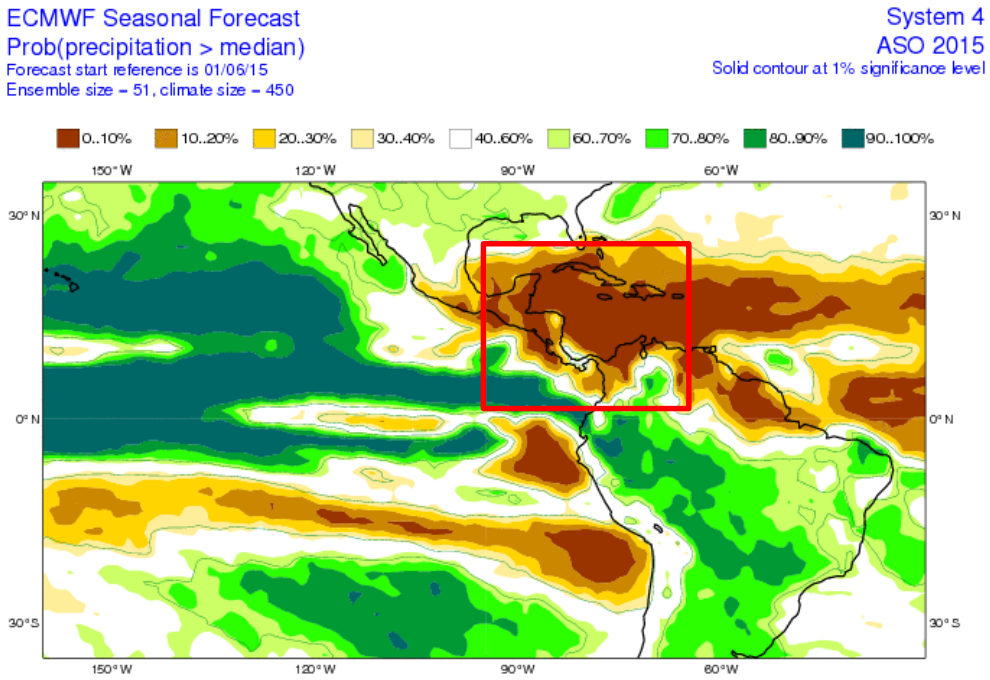


Rainfall (top left) and vegetation (top right) conditions by end of June 2015. Warm shades for below average conditions, cool shades for above average conditions.

Current forecasts for the *Postrera* season (August-November)

Several seasonal forecasts consistently indicate below average rainfall throughout the coming *Postrera* season (August to November).

Given the current evolution of the *Primera* season, if these forecasts are realized, the region will endure two poor cropping seasons in 2015 adding to the lingering effects of last year's severe drought affecting overall food security.



Seasonal forecasts for Aug to Oct rainfall (right); orange to browns, drier than average, green shades wetter than average.

Regional Seasonal Outlook

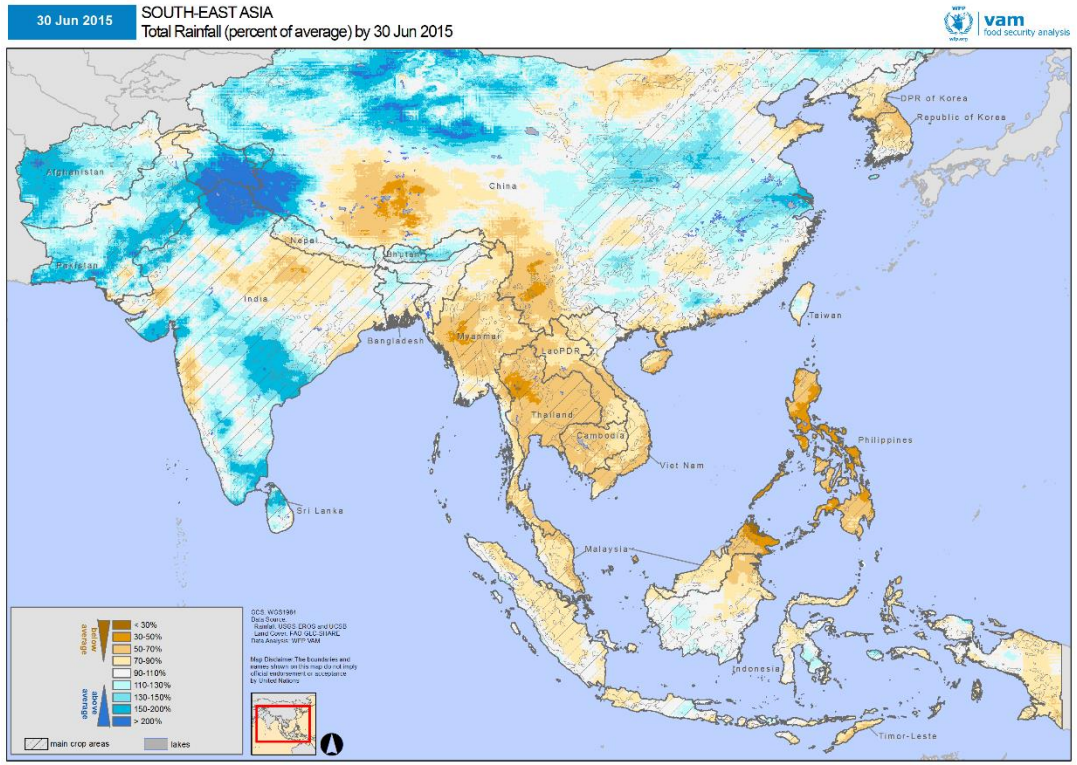
South and South-East Asia, July-November 2015

The Situation So Far (late June 2015)

El Nino is historically associated with lower rainfall amounts during the northern hemisphere Summer in the Indian subcontinent and in north-eastern China, and southeast Asia to a lesser degree. Indonesia also has a strong El Nino response, with marked rainfall deficits extending throughout the year.

Above average rainfall patterns across the India, Pakistan, Afghanistan and most of China have dominated thus far. In contrast, South East Asia, had a fairly poor start to the season with pronounced rainfall deficits extending across from northern Burma to southern Vietnam. Similarly drier than average conditions have also affected the Philippines and North East Borneo during the planting and early development stages of the main maize and rice crops

The critical period in terms of seasonal performance, particularly in India, is July to September.

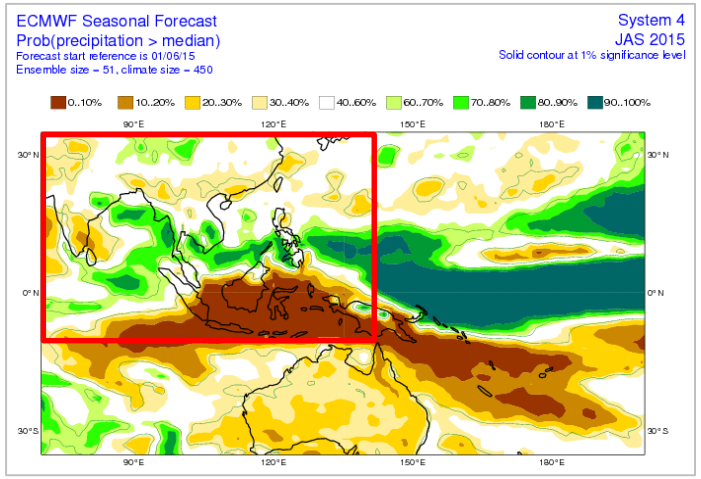


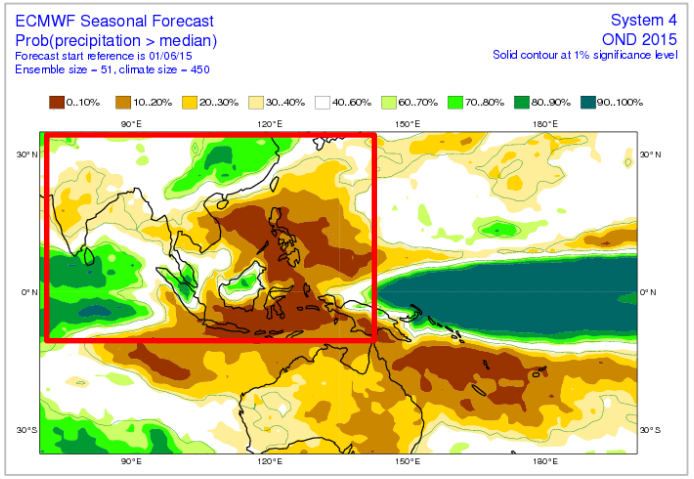
Rainfall conditions until end of June 2015. Warm shades for drier than average conditions, cool shades for wetter than average conditions.

Current forecasts for the season (July-September, October-December)

Forecasts for the July to September rainfall indicate drier than average conditions over the southern half of India and most of Indonesia. The Indian Meteorological Department issued a Monsoon forecast stating that rainfall during this period would reach 88 percent of the normal, slightly below the official “drought” threshold of 90 percent. Prospects are more favourable for southeast Asia and Philippines where forecasts are for wetter than average conditions, hopefully alleviating impacts of a drier than average first part of the season.

Forecasts for the later part of the year (October to December) are more pessimistic with drier than average conditions extending to southeast Asia and particularly affecting Indonesia, where the last quarter of the year includes the planting and early development stages of the main rice and maize crops. In the Philippines these drier than average conditions will affect the second season crops.





Seasonal forecasts for Jul - Sep rain (below left) and Oct-Dec rainfall (below right); orange to browns, drier than average, green shades wetter than average.

Regional Seasonal Outlook

East Africa: Horn of Africa, October-December 2015

The Previous Season (Long Rains, March-May 2015)

After a succession of poor seasons during late 2013 and 2014, the March to May 2015 Long Rains season was favourable across most of the region, particularly in Kenya, Somalia, southeast Ethiopia and Uganda. In contrast, bimodal areas of northeast and central Ethiopia were affected by drought during the first season (Belg).

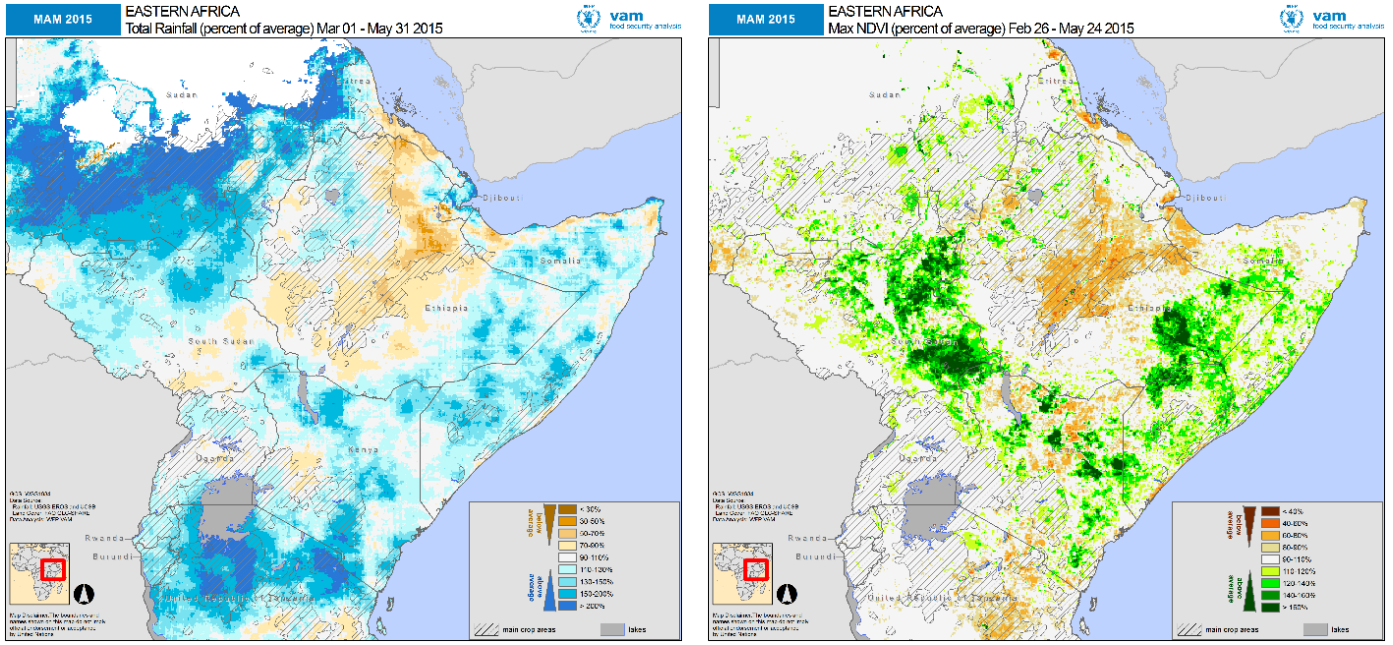
The marginal semi-arid areas of Kenya, southeast Ethiopia and Somalia experienced much needed relief from the persistent poor conditions of the past few seasons.

Current forecasts for the coming season (October-December)

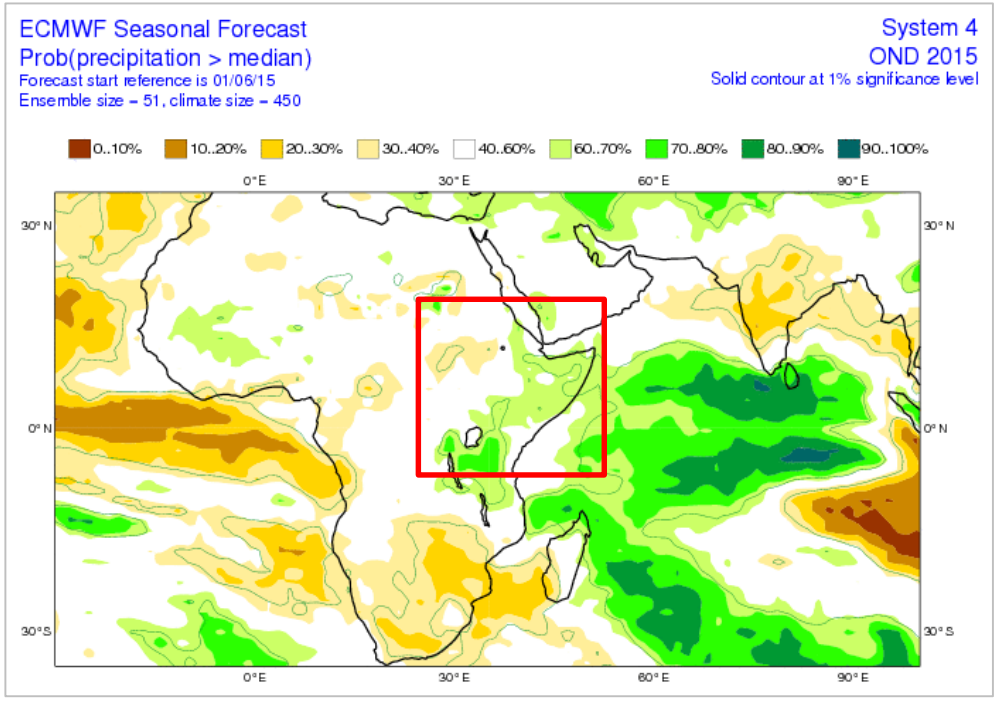
The next rainfall season in the Horn of Africa—not considering central and northern Ethiopia—takes place from October to December 2015, precisely at the peak of the El Nino event now unfolding.

ECMWF forecasts for this period present a favourable perspective with above average rainfall across the region. These forecasts have a four month lead time and so they are at the limit of what is currently feasible. However, historically El Nino events at this time of the year are indeed strongly associated with much wetter than average conditions across the region.

The most likely scenario for the next season is therefore good pasture and crop development just like in the previous season. This will further help to rebuild assets of the pastoralist communities. On the downside, there will be an increased risk of flooding along the main river systems in Kenya and Somalia.



Rainfall (top left) and vegetation (top right) conditions during previous season March to May 2015. Warm shades for below average conditions, cool shades for above average conditions.



Seasonal forecasts (right) for Oct to Dec rainfall; orange to browns, drier than average, green shades wetter than average.

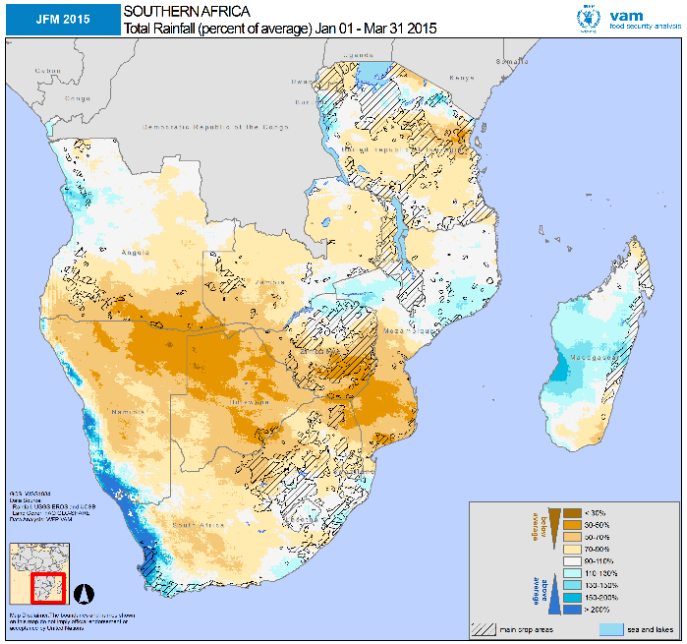
Regional Seasonal Outlook

Southern Africa, October 2015-April 2016

The Previous Season (October 2014 – April 2015)

Growing seasons in the southern Africa region (and in South Africa in particular) typically have strong connections with El Nino events, usually culminating in drier than average conditions and crop production deficits. The links to poor crop production are particularly evident for South Africa, the main regional maize producer.

The latest growing season in southern Africa which ended in April 2015, developed under borderline conditions and its later stages took place under an El Nino event: severe rainfall deficits affected the core growing period between January to March leading to large regional crop production deficits.



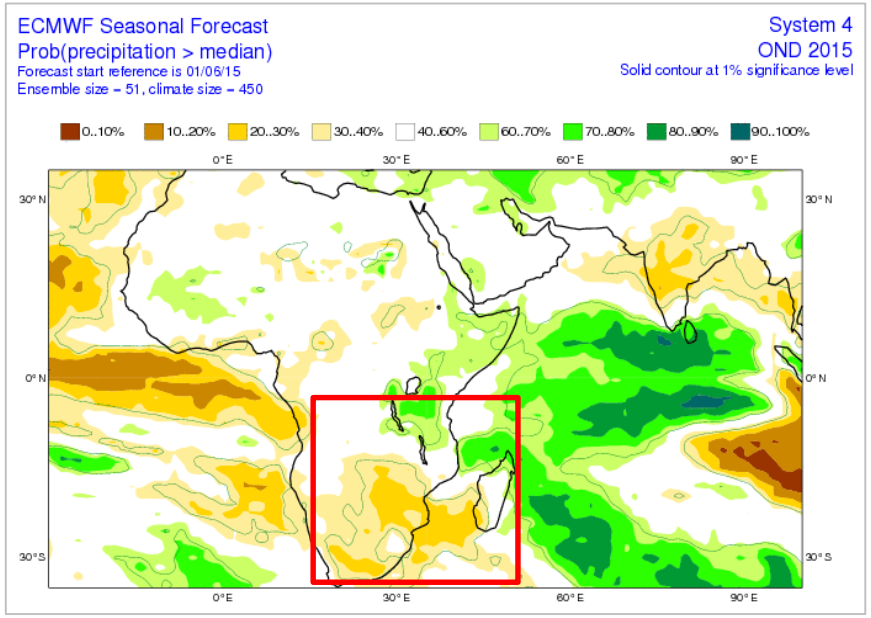
Rainfall (top left) and vegetation (top right) conditions during Jan to March 2015, the core period of the previous southern Africa growing season. Warm shades for below average conditions, cool shades for above average conditions.

Current forecasts for the coming season (October-December)

The next rainfall season in this region will last from October to May 2016. El Nino is expected to affect this season until March 2016. The critical maize crop development stages which will occur in early 2016 are likely to be affected.

ECMWF forecasts are available covering the October-December 2015 period. They indicate lower than average rainfall during the early stages of the next season in South Africa, Botswana, southern Mozambique and Zimbabwe. However, a word of caution as forecasts at such long temporal ranges have inherently lower accuracy.

Since El Nino events usually have a marked influence on crop production in Southern Africa and particularly in South Africa, negative impacts on regional crop production may be felt. Given that the previous season was already influenced by an El Nino event and registered significant production losses, there are now lower regional stocks to cope with another possible regional scale shortfall in crop production.



Seasonal forecasts (right) for Oct to Dec rainfall; orange to browns, drier than average, green shades wetter than average.

Data Sources:

Rainfall: CHIRPS, Climate Hazards Group, UCSB

Vegetation: MODIS NDVI, EOSDIS-NASA

Land Cover: FAO GLC-Share

Processing:

VAM software components, ArcGIS

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